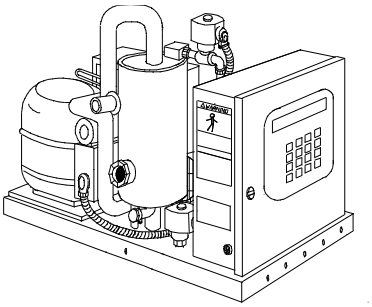
Guide specification for the **REDI CONTROLS Redi-Purge™ MODELS PRG-11/123-C3 & PRG-113-C3, High Efficiency Purges.**

Performance Specifications
For the High Efficiency Purge System:



The HIGH efficiency purge system shall be installed on existing low pressure centrifugal chiller equipment to improve the effectiveness of the purge cycle to separate air or other non-condensables from the chiller refrigerant charge. The HIGH efficiency purge system shall reduce the amount of refrigerant expelled to the atmosphere during normal purge operation.

Requirements

A. Scope:

1. The HIGH efficiency purge system shall remove air, moisture and acids from the chillers refrigerant. The system shall remove these non-condensables without expelling more than 0.59 pounds of refrigerant for every pound of air purged (.0049 lbs of CFC per pound of air when used with an optional activated Carbon Emissions Collection Canister; or virtually zero emissions when used with an optional Cryoline Emission Collection Canister), operating at standard room conditions and at chiller operating temperatures at 100º F condensing temperature and 40º F evaporator temperature. The purge system shall be capable of providing normal, unattended operation while the chiller is operating or idle.

2. The HIGH efficiency purge system shall have an integrated, microprocessor based control system. Purge to operator communication shall be accomplished via a two row alphanumeric LCD display, back lighted to facilitate viewing in low light ambient conditions, and a 16-switch keypad. The microprocessor controls shall be housed in a ETL listed, NEMA Type 1 steel enclosure to protect the electronics from dust and moisture. The enclosure shall have a hinged and latched door.

3. Installation of the HIGH efficiency purge system shall not require the removal of the chillers refrigerant charge or drilling and/or welding to the condenser shell. The HIGH efficiency purge unit shall be capable of being installed (when space permits) in the same location as the old purge unit, or at a location conducive to ease of operation and serviceability.

4. Complete purge installation, testing, start-up and operation/maintenance literature shall be provided. The purge manufacturers shall be able to provide local technical support.

5. There shall be a separate HIGH efficiency purge system for each low pressure chiller. Purge units must be ETL Listed. When installed, the HIGH efficiency purge shall not affect safety conditions within the equipment room.

B. Operation:

The purge must provide a liquid refrigerant return flow path back to the chiller evaporator utilizing the chillers natural operating differential pressure to assure proper liquid return. The use of a “Metering Orifice” in the Liquid Return line is unacceptable.

In both chiller idle and operating modes the HIGH efficiency purge system must be capable of starting and stopping on an automatic self-adjusting basis in order to minimize purge run time and to reduce energy usage. During chiller non-operation (chiller off) the purge shall be capable of operating in like manner.

The HIGH efficiency purge system will provide:

1. Purge operation regardless of chiller compressor on/off status.
2. Purge operation only when the chiller compressor is running.
3. Automatic self-adjusting purge operation based upon the last 30 days of purge operating history. This mode of operation shall be user selectable in both the "on" and "auto" modes of purge operation.

The purge system must incorporate a filter-drier system in the vapor inlet line to the purge tank capable of removing moisture, acids and particulates from the chiller's refrigerant to ARI-700 specifications in a single pass before it enters the purge system where it can cause corrosion build-up on the purge condensing coils reducing purge efficiency. Installation of a filter-drier in the liquid return line only is unacceptable.

C. Design:

The HIGH efficiency purge shall have an integrated, microprocessor based control system. Purge to operator communication shall be accomplished via a two row alphanumeric LCD display, back lighted to facilitate viewing in low light ambient conditions, and a 16-switch keypad.

The purge shall be capable of logging and displaying purge unit refrigeration compressor suction temperature, purge tank evaporating temperature and chiller condenser saturation temperature.

The purge shall be capable of logging and displaying Purge Pump-Out Rate for the:

1. Last 24 hour period.
2. Last 30 day period as an average.
3. Total accumulation since installation.

The purge shall be capable of logging and displaying the last 30 day Purge Pump-Out Average Time for the following conditions:

1. While the chiller was running. Indicating chiller low side leakage.
2. While the chiller was off. Indicating low and high side leakage.

3. During the first three hours after chiller shutdown. Indicating air logging during chiller operation.

The purge will include an accumulative pump-out time log and elapsed day log for tracking purge operation relative to chiller service.

The purge system shall be suitable for use with refrigerants CFC-11 or HCFC-123 or 113. The purge system shall not contain nor utilize CFC, HCFC or water to operate the purge cooling system. As standard, the HIGH efficiency purge system will incorporate a self-contained air cooled refrigeration system that allows purging when the chiller is off. The capacity of the self-contained refrigeration system will be no less than 1/3 HP. (1230 BTUH at 0º F evaporator temperature). The refrigeration system shall be completely isolated from the chiller's refrigerant charge and shall utilize refrigerant HFC-134a. The refrigeration system compressor will incorporate a low side access valve for serviceability. The system shall also utilize an adjustable type constant pressure expansion valve to allow future calibration to compensate for normal wear. Regulating purge tank temperature to 0º F is critical to purge efficiency, therefore non calibratable type metering devices are not acceptable.

The purge system will include a moisture indicating sight glass to indicate excessive moisture content in the chiller's refrigerant.

The purge system will not utilize an oil-less piston type compressor.

D. Efficiency:

The HIGH efficiency purge system shall expel no more than 0.59 pounds of refrigerant for every pound of air purged (.0049 lbs of CFC per pound of air when used with an optional activated Carbon Emissions Collection Canister; or virtually zero emissions when used with an optional Cryoline Emission Collection Canister), operating at standard room ambient conditions and at chiller operating conditions of 100º F condensing temperature and 40º F evaporator temperature. The manufacturer’s stated efficiency must be the efficiency sustained over the life of the purge. Purge efficiency shall not decrease due to normal usage. If the HIGH efficiency purge utilizes carbon canister refrigerant absorption media to enhance efficiency, the media design capacity must exceed three years for typical chiller operation.

E. Safety Controls and Diagnostics:

The purge safety controls shall include protection against liquid refrigerant pump-out that can occur when the purge tank fills with liquid due to a drain-back malfunction or accidental drain-back line isolation. If an abnormal liquid level is detected, the purge shall shutdown operation and generate a latching fault diagnostic. The fault diagnostic must clearly delineate the fault condition as a "Drain Fault".

The purge system shall include the ability to sense excessive purge pump-out time and lockout purge operation based upon a user selectable maximum cumulative purge pump-out time during any 24 hour period. The adjustable time shall range from 1 to 100 minutes. Single function timers are not acceptable. The purge shall include a timed override of the lockout safety function. The override shall be user adjustable for timed override durations between 0 and 72. hours.

The HIGH efficiency purge device shall not violate the safety recommendations made by the OEM, (Original Equipment Manufacturer).

F. Maintenance:

* The purge tank design shall include a provision for cleaning the interior coils and surfaces from corrosion build-up caused by hydrochloric and hydrofluoric acids. This provision shall not necessitate cutting, soldering or welding.

G. Options:

The purge system shall be capable of providing the following options:

* Remote Control Panel
* Chiller Condenser “low saturation temperature lockout”
* Pre-Alarm “evaporator overpressure alarm”
* Carbon collection Canister
* Cryoline Virtually Zero Emission Collection Canister
* Cryoline Emission Collection Canister Saturation Alarm